

# RISKS AND RISK MANAGEMENT

Vattenfall creates economic value when it exceeds the required rate of return on net assets with a set level of balanced risk. In the course of its business, Vattenfall is exposed to financial risks (such as price risk and credit risk) as well as non-financial risks (such as political risk and environmental risk). The risk management process entails that risks that could pose a threat to Vattenfall's goals are identified and remediated, but also that Vattenfall can enhance the company's value creation and competitiveness through balanced risk-taking.

## Introduction of ERM

In 2008 Vattenfall adopted Enterprise Risk Management (ERM) to further improve risk management and governance within the company. Implementation was begun in 2008, and in 2009 ERM was established within the organisation. ERM is a process for identifying, evaluating, remediating, following up, reporting and controlling risks. It includes a method of risk management that gives Vattenfall an effective means of taking uncertainties, risks and opportunities in the company into account and comparing them with each other. This can be used in decision-making documentation and thereby lead to improved quality. By enabling quantification and comparability of both financial and non-financial risks, ERM has led to greater transparency and risk awareness throughout the organisation.

## Risk organisation

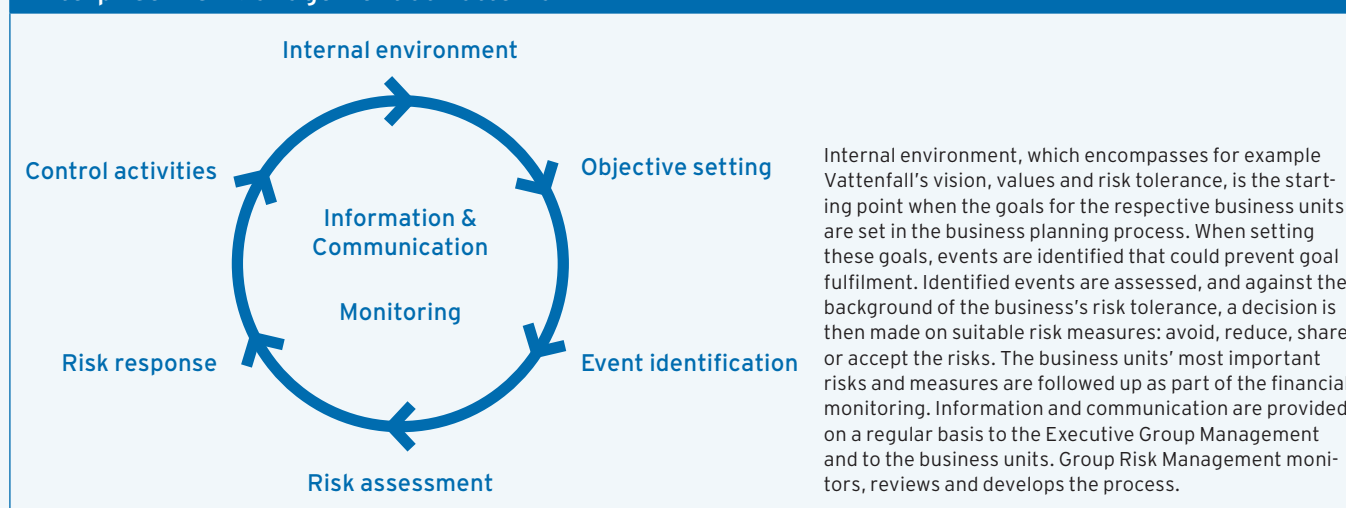
The Board of Directors has overarching responsibility for internal control and risk management at Vattenfall. To achieve a clearer and more effective risk organisation, in June 2009 Vattenfall appointed a Chief Risk Officer (CRO), who is responsible for the company's risk management function (Group Risk Management) and reports to the Group's Audit Committee. The CRO has overarching

responsibility for the ERM process and is also responsible for providing support to decision-makers in the management of risks and opportunities.

The business units are responsible for their own risks and report on these risks to Group Risk Management. The Group's risk management is co-ordinated by the central Vattenfall Risk Committee (VRC), which is tasked ensuring that the heads of the various business units are aware of their risks, reviewing principles and mandates, and approving risk instructions. The committee is also responsible for ensuring that uniform definitions of risks are used within the Group. In addition to the VRC, Vattenfall has several local risk committees and risk-specific committees.

Vattenfall has identified the environment and nuclear power safety as particularly high priority focus areas. To ensure development and risk management within these areas, specifically designated persons have been appointed who, in co-operation with specific committees, are responsible for these matters at a Group-wide level. The Chief Nuclear Officer (CNO) is responsible for nuclear power safety, and the Head of Environmental Affairs is responsible for environmental risks. Both report to the Executive Group Management, and their respective risks make up part of Vattenfall's overall risk reporting.

## Enterprise Risk Management at Vattenfall



## Risk categories and risk areas

### Market and Financial

Risks related to competition, prices and sales volumes, interest rates, currencies, credit and counterparties  
See page 76

### Technology

Risks related to all technology that is needed to produce, transmit, distribute and sell electricity, gas, heat and other related products and services  
See page 80

### Infrastructure

Risks related to all infrastructure that Vattenfall needs for its operations. This includes IT infrastructure (hardware and software), telecommunications, buildings and safety systems  
See page 80

### Politics & Society

Risks that are affected by regional and global political and social trends  
See page 81

### Laws & Regulations

Risks related to all laws and regulations that apply for Vattenfall  
See page 81

### Personnel & Organisation

Risks related to Vattenfall's organisation, processes and employees, such as company culture, leadership and motivation  
See page 81

### Examples of risks in the respective risk areas (which are clarified on the following pages):

Electricity price risk  
Volume risk  
Price area risk  
Credit risk  
Fuel price risk  
Liquidity risk  
Interest rate risk  
Currency risk  
Investment risk (financing)

Plant risks  
Environmental risks  
Investment risk (technology)

IT and information security risks

Political risk

Legal risks  
Environmental risks  
Investment risk (environmental permits)

Risk of losing expertise and key persons

### Risk measures

Avoid

Reduce

Share

Accept

### Market and financial risks

Vattenfall's board has given the CEO a total risk mandate for the Group, which is delegated onward to the business units. The CRO proposes the mandates that are delegated in the organisation. These mandates aim for balanced risk-taking for wholesale price risks. Every business unit has scope to manoeuvre within its respective mandate and is responsible for ensuring that reliable risk measurement is performed.

#### Electricity price risk

Electricity price risk is the factor that has the single greatest bearing on Vattenfall's earnings and is thus the most important factor for value creation. A sensitivity analysis of changes in the wholesale price of electricity is provided in the table opposite.

Electricity prices are determined by fundamental factors such as supply (for example, water levels and available generation capacity), demand (steered by electricity use, which in turn is affected by weather and the economy, for example), fuel prices and prices of CO<sub>2</sub> emission allowances. Vattenfall analyses these factors continuously in order to be able to successfully manage electricity price risk.

Vattenfall hedges its generation and sales with the help of physical and financial electricity forward contracts for electricity that is available on the market. Such hedging

is done while taking into account liquidity in the market at different periods in time. As the sharp fluctuations electricity prices have shown in recent years, futures trading is an important way of smoothing out and balancing the major price risks in the business. The amount that is hedged varies (see chart on page 77). Vattenfall also enters into long-term contracts with major industrial customers. These contracts pertain to time horizons in which there is no possibility to hedge prices in the market and which stretch as far as 2022. The total scope for the period 2013–2022 amounts to 108 TWh. The business units conduct their hedging in Vattenfall's various markets through Vattenfall Energy Trading, which hedges its own positions in external markets via electricity exchanges, such as Nord Pool and the European Energy Exchange (EEX), as well as through bilateral trading with other counterparties. The mandates allocated to the various business units regulate how large of an electricity price risk is acceptable. Exposure is followed up in relation to the mandate on a daily basis. To measure electricity price risk, Vattenfall uses methods such as Value at Risk (VaR) and Profit at Risk (PaR) along with various stress tests.

**Sensitivity analysis**

| Market-quoted risks | Impact on profit before tax, SEK million, for the three-year period 2010–2012 <sup>1</sup> | Calculated yearly volatility 2009, % |
|---------------------|--|--------------------------------------|
| Electricity         | +/-11,000  | 23                                   |
| Coal                | +/-1,000   | 26                                   |
| Gas                 | +/-800   | 28                                   |
| CO <sub>2</sub>     | +/-600   | 52                                   |
| Uranium             | +/-< 100   | -                                    |

1) Given a price movement of +/-10%, based on Vattenfall's hedges as per 31 December 2009.

The sensitivity analyses based on variations in various market-quoted risks are performed independent of each other. Each parameter is calculated separately without any connection to the other risks. Most of the parameters affect Vattenfall's earnings with respect to both income and expenses, due to the pricing connection that exists between coal, gas, oil and electricity prices, and prices of CO<sub>2</sub> emission allowances in the market. The volatilities are based on a three-year contract for the respective commodities. Price movements are calculated taking into account daily market movements in 2009 and recalculated to yearly volatilities. For electricity, the volatilities for the Nordic countries, Germany, the Netherlands and Poland have been weighed together based on Vattenfall's open positions in the respective markets.

**Volume risk**

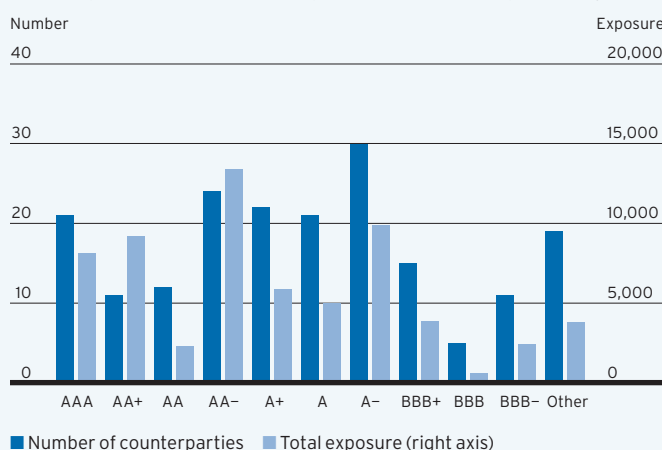
Volume risk is the risk of actual volume deviating from planned volume. In the generation activities, Vattenfall manages its volume risk through analysis and forecasting activities concerning precipitation and snowmelt. Analysis models are based on extensive weather history, among other things.

Volume risk arises also in the sales activities as deviations in anticipated and actual volumes delivered to customers. Volume risks are managed by improving and developing forecasts of electricity consumption. When choosing electricity contracts, customers can choose themselves the level of risk they are willing to accept.

**Price area risk**

Price area risk arises when the price of electricity differs between various geographic areas. Vattenfall's price area risk is centralised and is managed by Vattenfall Energy Trading. In Nordic countries, the Nord Pool provides financial instruments – price area swaps (Contracts for Differences, CfDs) – which can be used to manage price area risk. Vattenfall

Counterparties, number and exposure, SEK million, per rating class

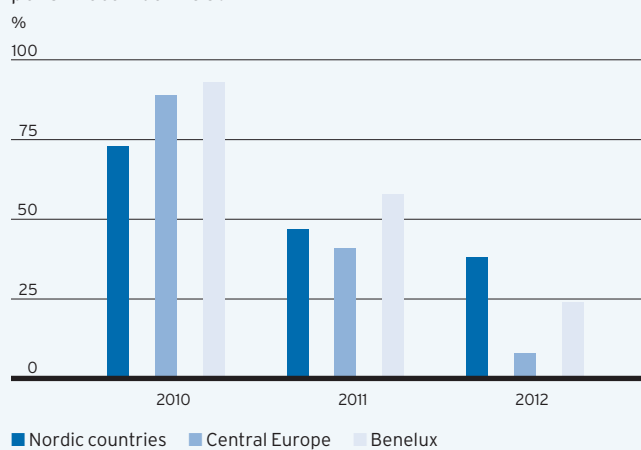


■ Number of counterparties ■ Total exposure (right axis)

The chart shows Vattenfall's counterparties in which Vattenfall's exposure is greater than EUR 5 million per counterparty. The breakdown is based on rating classes and the amount of the credit exposure per rating class. The rating classes are from Standard & Poor's. "Other" consists of exceptions for contracts that have existed for a long time and which Vattenfall has taken over in connection with acquisitions.

**Vattenfall's degree of price hedging**

Vattenfall's degree of price hedging in various markets per 31 December 2009

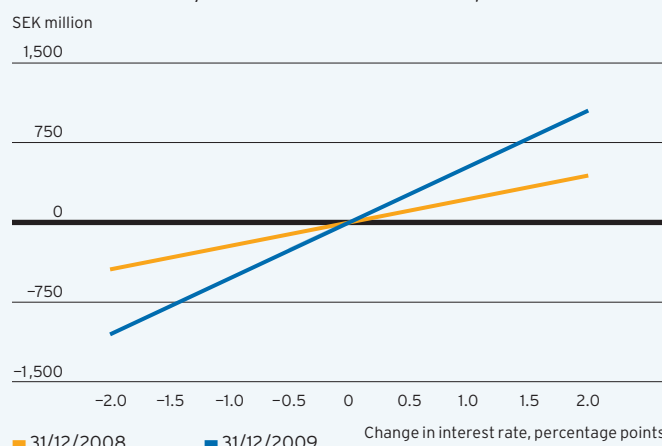


Energy Trading is also a CfD market maker on Nord Pool. Through this undertaking, liquidity is ensured in these financial instruments. Price differences also exist between the various areas in which Vattenfall is active. These are managed through contracts in these price areas and contracts for transmission capacity.

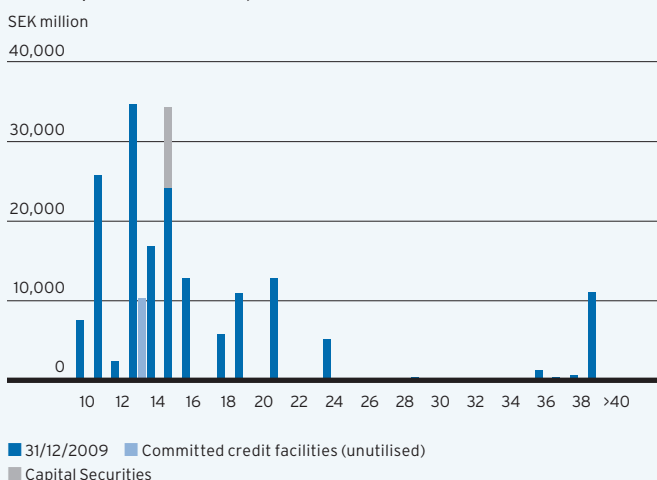
**Credit risk**

Vattenfall is exposed to credit risks in connection with electricity trading, investments and derivative contracts. Vattenfall uses external rating information, where available, to manage and mitigate its credit risk. In other cases, internal models are used to establish the creditworthiness of its counterparties. Individual limits are established for each counterparty, which are evaluated on a regular basis. Exposures are followed up in relation to the credit limits on a daily basis. If necessary, additional credit assurances are demanded in the form of a guarantee from the parent company or a bank, for

Interest rate sensitivity, excluding Capital Securities and loans from minority owners and associated companies



The chart shows how changes in interest rates affect the Group's interest expenses over a 12-month period based on the Group's present fixed rate structure.

Maturity structure, debt portfolio<sup>1</sup>

1) Excl. loans from minority owners and associated companies.

example. In cases where master agreements are entered into, net calculation of debts and receivables for an individual counterparty are permitted. In cases where Vattenfall has more than one master agreement with the same counterparty, a Master Netting Agreement is desirable in order to calculate the net debt and receivable amount, even when trading in different commodities, such as electricity, coal and gas. In many cases, agreements are used which limit credit risk through an arrangement by which the parties pledge assets to each other if the exposure exceeds certain, set amounts, such as Credit Support Annex (CSA) agreements. In cases where contracts are traded in marketplaces, such as Nord Pool or EEX, with central counterparty clearing, the credit risk is against the marketplace.

## Credit risks

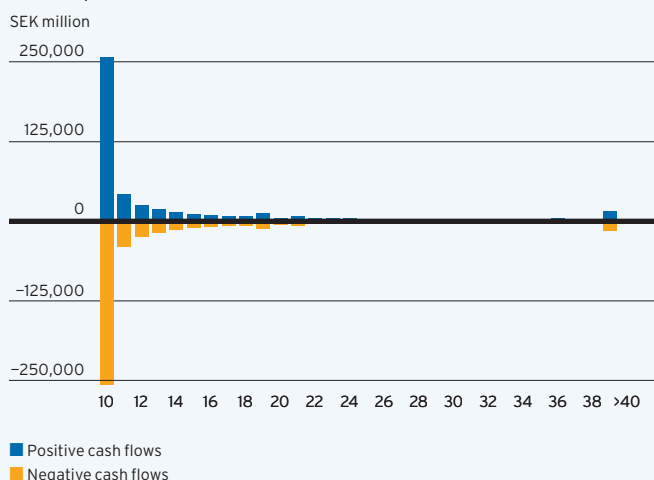
| Type of instrument  | Exposure      |
|---|---------------|
| Exposure from electricity transactions – positive market values | 17,731        |
| Exposure from electricity transactions – settlement risks       | 7,369         |
| Interest and currency derivatives – position market values      | 921           |
| Fixed-income investments, including large bank balances         | 33,512        |
| Shares  | 847           |
| <b>Total</b>  | <b>60,380</b> |

Total credit exposure from electricity transactions taking into account netting under agreements amounted to SEK 24,259 million. Exposure in interest and currency derivatives adjusted for netting under ISDA agreements or the equivalent amounts to SEK 921 million (3,477). This calculation takes into account margin security requirements under CSA agreements, totalling SEK 2,689 million (1,843). Without adjustment for ISDA and CSA agreements, the exposure amounts to SEK 8,903 million (12,125).

## Fuel price risk

Measurement and management of fuel price risk is conducted within the individual generation units. Fuel prices are affected by macroeconomic factors, among other things. Financial and physical instruments for e.g., coal and oil are used to smooth earnings over time. However, most of Vattenfall's coal-fired plants in Germany use lignite from Vattenfall's own mines. For coal-fired electricity generation, hedges on electricity and coal prices are co-ordinated to safeguard margins. Uranium is used as fuel in Vattenfall's nuclear power plants. This price risk is limited, however, since the uranium fuel constitutes a relatively small portion

## Maturity structure, derivatives



of the generation cost. Fuel price risk is minimised through analysis of the various commodity markets and diversification of contracts with respect to price and terms.

## Liquidity risk

Liquidity risk with respect to physical and financial derivative instruments pertains to the risk of not being able to pursue the trading strategy due to insufficient liquidity in the market.

Liquidity risk can also be described as the risk for a financing crisis, whereby Vattenfall does not have the ability to finance its capital needs. In this regard, liquidity risk is mitigated by maintaining an even maturity structure and a long average remaining term in the company's debt portfolio.

Liquidity risk is also mitigated by the Group's having several types of debt issuance programmes and thereby ensuring its access to capital and flexibility. The Group's target for short-term accessibility to capital is always to have no less than 10% of the Group's sales and at least the equivalent of the next 90 days' maturities in the form of liquid assets or committed credit facilities. Credit ratings from rating agencies such as Standard & Poor's and Moody's affect Vattenfall's ability to fund its capital requirement. A stable credit rating over time instils confidence among bond investors and creditors and thereby reduces liquidity risk by creating favourable opportunities to refinance matured loans.

## Borrowing programmes and credit facilities

| SEK million                        | Maximum aggregated amount | Currency | Maturity | Used proportion, % | Reported external liability |
|------------------------------------|---------------------------|----------|----------|--------------------|-----------------------------|
| <b>Borrowing programmes</b>        |                           |          |          |                    |                             |
|                                    | 15,000                    | SEK      |          | -                  | -                           |
|                                    | 2,000                     | USD      |          | -                  | -                           |
|                                    | 15,000                    | EUR      |          | 73                 | 113,998                     |
| <b>Committed credit facilities</b> |                           |          |          |                    |                             |
|                                    | 1,000                     | EUR      | 2013     | -                  | -                           |
|                                    | 100                       | SEK      |          | -                  | -                           |
| <b>Other credit facilities</b>     |                           |          |          |                    |                             |
|                                    | 10,342                    | SEK      | -        | -                  | -                           |
| <b>Total</b>                       |                           |          |          |                    | <b>113,998</b>              |

1) Back-up-facility for short-term borrowing.

| Benchmark bonds<br>Type | Currency | Amount | Coupon, % | Maturity |
|-------------------------|----------|--------|-----------|----------|
| Euro Medium Term Note   | EUR      | 500    | 6.000     | 2010     |
| Euro Medium Term Note   | EUR      | 850    | 5.750     | 2013     |
| Euro Medium Term Note   | EUR      | 500    | 4.125     | 2013     |
| Euro Medium Term Note   | EUR      | 1,350  | 4.250     | 2014     |
| Euro Medium Term Note   | EUR      | 1,100  | 5.250     | 2016     |
| Euro Medium Term Note   | EUR      | 500    | 5.000     | 2018     |
| Euro Medium Term Note   | EUR      | 650    | 6.750     | 2019     |
| Euro Medium Term Note   | GBP      | 350    | 6.125     | 2019     |
| Euro Medium Term Note   | EUR      | 1,100  | 6.250     | 2021     |
| Euro Medium Term Note   | EUR      | 500    | 5.375     | 2024     |
| Euro Medium Term Note   | GBP      | 1,000  | 6.875     | 2039     |

### Interest rate risk

Interest rate risk in the Group's debt portfolio is measured in terms of duration, which is permitted to vary from a norm of 4 years by up to 12 months either way. The norm period was increased to 4 years from 2.5 years in spring 2009. The duration of the Group's debt portfolio at year-end was 4.0 years. Including Capital Securities the duration was 4.1 years. To adjust the duration of borrowing, the company uses interest rate swaps, interest rate forwards and options, among other things.

#### Remaining fixed rate term in loan portfolio

Excluding Capital Securities and loans from minority owners and associated companies. Nominal amounts.

| SEK million     | SEK           | EUR            | Other      | Total          |
|-----------------|---------------|----------------|------------|----------------|
| < 3 months      | -437          | 68,549         | 14         | 68,126         |
| 3 months-1 year | 1,424         | -11,509        | 4          | -10,081        |
| 1 year-5 years  | 9,664         | 62,873         | 696        | 73,233         |
| > 5 years       | 6,895         | 36,481         | 3          | 43,379         |
| <b>Total</b>    | <b>17,546</b> | <b>156,394</b> | <b>717</b> | <b>174,657</b> |

| Average financing interest rate, % | 5.7 | 3.3 | 5.0 | 3.5 |
|------------------------------------|-----|-----|-----|-----|
|------------------------------------|-----|-----|-----|-----|

#### Remaining fixed rate term in loan portfolio

Excluding Capital Securities and loans from minority owners and associated companies. Nominal amounts.

| SEK million     | Debt           | Derivatives   | Total          |
|-----------------|----------------|---------------|----------------|
| < 3 months      | 11,303         | 56,823        | 68,126         |
| 3 months-1 year | 2,681          | -12,762       | -10,081        |
| 1 year-5 years  | 76,197         | -2,964        | 73,233         |
| > 5 years       | 85,952         | -42,573       | 43,379         |
| <b>Total</b>    | <b>176,133</b> | <b>-1,476</b> | <b>174,657</b> |

### Currency risk

Currency risk pertains to the risk of a negative impact on the consolidated income statement and balance sheet caused by changes in exchange rates. Vattenfall is exposed to currency risk through exchange rate movements attributable to future cash flows (transaction exposure) and in the revaluation of net assets in foreign subsidiaries (translation or balance sheet exposure). The Group's goal in managing currency risk is to minimise exchange rate effects while taking into account hedging costs and tax aspects. Currency exposure in borrowing is eliminated using currency interest rate swaps for the purpose of avoiding the effect of exchange rate differences on earnings.

### Loan portfolio, breakdown per currency

Including loans from minority owners and associated companies but excluding Capital Securities. Nominal amounts.

| Original currency | Debt           | Derivatives   | Total          |
|-------------------|----------------|---------------|----------------|
| CHF               | 3,998          | -3,998        | -              |
| DKK               | 699            | -             | 699            |
| EUR               | 155,271        | 17,858        | 173,129        |
| GBP               | 15,509         | -15,505       | 4              |
| JPY               | 4,519          | -4,519        | -              |
| NOK               | 2,828          | -2,828        | -              |
| PLN               | 14             | -             | 14             |
| SEK               | 17,981         | 7,516         | 25,497         |
| <b>Total</b>      | <b>200,819</b> | <b>-1,476</b> | <b>199,343</b> |

The Group has limited transaction exposure, as most generation, distribution and sales of energy take place in the respective companies' local markets. In the Nordic operations, most transaction exposure arises in conjunction with the hedging of electricity prices, primarily on Nord Pool, since trading is conducted partly in EUR, while in the German and Danish subsidiaries, transaction exposure arises primarily in conjunction with purchases of fuel. In both cases, currency risk is managed through the use of forward exchange contracts.

### Consolidated operating revenues/expenses per currency, %

| Currency     | Revenues   | Expenses   |
|--------------|------------|------------|
| EUR          | 73         | 78         |
| SEK          | 17         | 13         |
| PLN          | 5          | 5          |
| DKK          | 3          | 2          |
| Other        | 2          | 2          |
| <b>Total</b> | <b>100</b> | <b>100</b> |

Values are calculated based on a statistical compilation of external operating income/expenses. Changes in inventory and investments are not included in the compilation.

The Group's units are required to hedge contracted transaction exposure when it exceeds the equivalent of SEK 10 million. Hedges are made through Vattenfall's Treasury unit, where currency risks are managed within established risk limits for interest rates and currencies.

With respect to translation exposure, a 5% change in exchange rates would affect the Group's equity by approximately SEK 5,590 million (3,320). Reporting of translation exposure is described in Note 2 to the consolidated accounts, Accounting policies, under the headings Derivative instruments and Hedge accounting.

### Translation exposure

| Currency     | Equity         | Hedging after tax | Net exposure after tax |
|--------------|----------------|-------------------|------------------------|
| DKK          | 10,775         | 6,297             | 4,478                  |
| EUR          | 203,037        | 119,702           | 83,335                 |
| GBP          | 7,671          | -                 | 7,671                  |
| PLN          | 19,764         | 3,409             | 16,355                 |
| Other        | 1              | -                 | 1                      |
| <b>Total</b> | <b>241,248</b> | <b>129,408</b>    | <b>111,840</b>         |



